

Public Workshop to Discuss Reducing Emissions from  
Mobile Cargo Handling Equipment at Ports and  
Intermodal Rail Yards

## Draft Regulatory Proposal

August 24, 2005  
Long Beach, California



California Environmental Protection Agency



Air Resources Board

## Overview

- ◆ Background
- ◆ Applicability
- ◆ Updated Regulatory Requirements
- ◆ Estimated Impacts
- ◆ Next Steps



## Background



## Goals

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- ♦ Develop statewide control measure to address emissions from mobile cargo handling equipment
  - Achieve maximum emission reductions (both near term and long term) for PM and NOx
- ♦ Consideration by the Board in November 2005

## Applicability



## Ports

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## Intermodal Rail Yards

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## Examples of Cargo Handling Equipment Types

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- ♦ yard trucks
- ♦ top handlers
- ♦ side handlers
- ♦ reach stackers
- ♦ rubber-tired gantry cranes
- ♦ forklifts
- ♦ euclids
- ♦ skid steer loaders
- ♦ rubber-tired loaders
- ♦ sweepers
- ♦ dozers
- ♦ excavators
- ♦ mobile cranes
- ♦ railcar movers

## Draft Regulatory Proposal



## Overview: Modifications to the Preliminary Concepts

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- ◆ Refined definitions
- ◆ Refined newly purchased/leased/rented equipment requirements
- ◆ Refined in-use yard truck requirements and compliance schedule
- ◆ Categorized in-use non-yard truck equipment and their requirements
- ◆ Added compliance extensions
- ◆ Refined/revised record keeping and reporting requirements
- ◆ Added Right of Entry and Severability clauses

## Newly Purchased, Leased, or Rented Equipment

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- ♦ DMV registered (onroad) equipment
  - meet current year onroad standard
- ♦ Non-registered (off-road) equipment
  - a. meet current year onroad standard or Tier 4 off-road standard for model year and rated hp; or
  - b. if (a) above is not available, meet highest level available off-road standard for model year and rated hp and apply highest level available VDECS within one year.

### *In-Use Yard Trucks*

## Summary of Changes to Proposed Concepts

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- ♦ Allowed VDECS that would meet the same standards as Tier 4 off-road as a compliance option
- ♦ Aligned the compliance for all pre-2003 model years
- ♦ Aligned the compliance for all levels of VDECS
- ♦ Revised the compliance schedule for fleets of 4 or more

### *In-Use Yard Trucks*

## Performance Standards

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- ♦ 2007 or current model year onroad engine standard
- ♦ Tier 4 off-road engine standard
- ♦ Engine with VDECS that meets or exceeds Tier 4 off-road standards



### *In-Use Yard Trucks*

## Compliance Table: Fleets of 3 or Less

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Engine Certification	Model Years	VDECS as of December 31, 2006	Compliance Deadline
Off-road	Pre-2003	None	December 31, 2007
Off-road	Pre-2003	Any Level	December 31, 2008
Off-road	2003-2006	None	Model Year + 7 Years
Off-road	2003-2006	Any Level	Model Year + 8 Years
Onroad	Pre-2007	None	Model Year + 8 Years
Onroad	Pre-2007	Any Level	Model Year + 9 Years

### *In-Use Yard Trucks*

## Compliance Table: Fleets of 4 or More

Engine Certification	Model Years	VDECS	Number of Yard Trucks for Each Model Year Group	Compliance Deadline
Off-road	Pre-2003	None	The greater of 3 or 50%	December 31, 2007
			100%	December 31, 2008
Off-road	Pre-2003	Any Level	The greater of 3 or 50%	December 31, 2008
			100%	December 31, 2009
Off-road	2003-2006	None	The greater of 3 or 25%	Model Year + 7 Years
			50%	Model Year + 8 Years
			100%	Model Year + 9 Years
Off-road	2003-2006	Any Level	The greater of 3 or 25%	Model Year + 8 Years
			50%	Model Year + 9 Years
			100%	Model Year + 10 Years
Onroad	Pre-2007	None	The greater of 3 or 25%	Model Year + 8 Years
			50%	Model Year + 9 Years
			100%	Model Year + 10 Years
Onroad	Pre-2007	Any Level	The greater of 3 or 25%	Model Year + 9 Years
			50%	Model Year + 10 Years
			100%	Model Year + 11 Years

If the percentage of yard trucks in a fleet is not a whole number, conventional rounding practices apply (i.e., if less than 0.5, round down; if 0.5 or greater, round up)

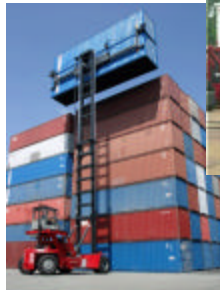
### *In-Use Non-Yard Truck Equipment*

## Summary of Changes to Proposed Concepts

- ♦ **Categorized the equipment types**
  1. Basic Container Handling
  2. Bulk Cargo Handling
  3. RTG Cranes
- ♦ **Requirement for 2<sup>nd</sup> step depends on category and level of VDECS**

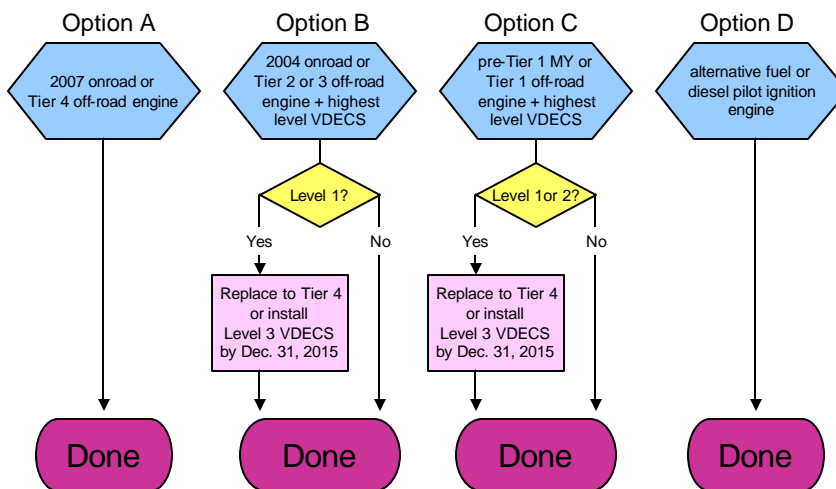


# BACT Requirements for Basic Container Handling Equipment



## *In-Use Non-Yard Truck Equipment*

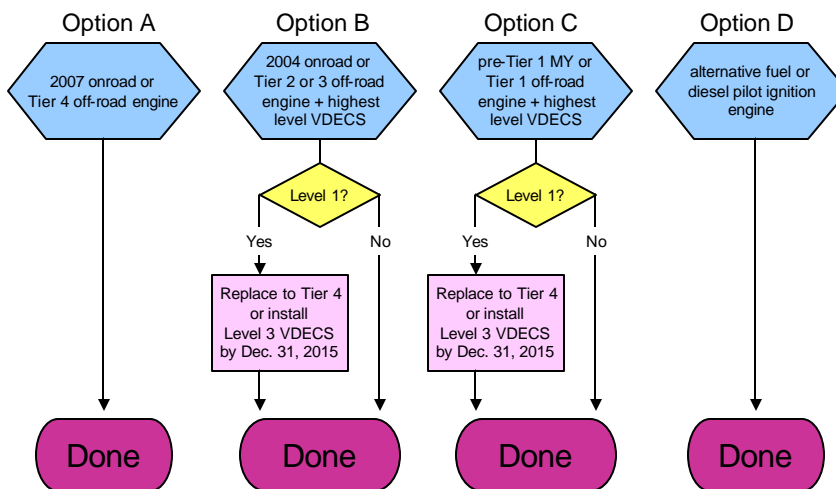
### Compliance Options – Basic Container Handling Equipment



## BACT Requirements for Bulk Cargo Handling Equipment



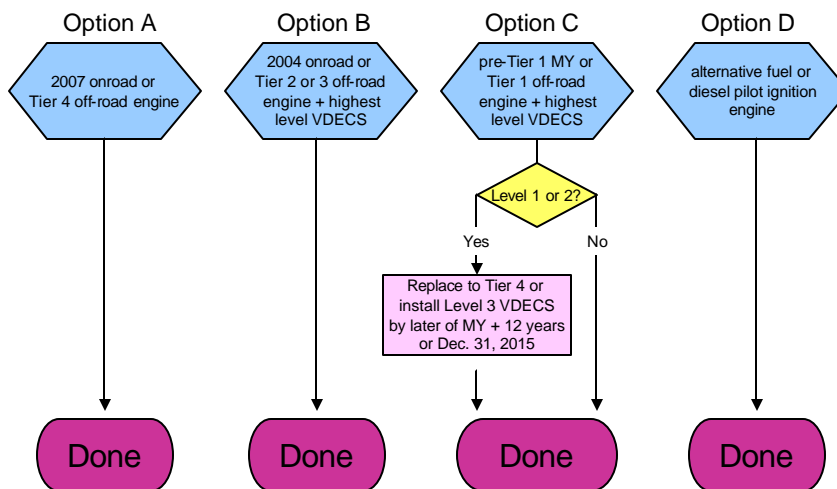
### *In-Use Non-Yard Truck Equipment* Compliance Options – Bulk Cargo Handling Equipment



## BACT Requirements for RTG Cranes



### *In-Use Non-Yard Truck Equipment* Compliance Options – RTG Cranes



## *In-Use Non-Yard Truck Equipment*

# Compliance Schedule

Engine Model Years	Compliance Date*				
	Non-Yard Truck Fleets of 3 or Fewer	Non-Yard Truck Fleets of 4 or More**			
		First 3 or 25% (whichever is greater)	50%	75%	100%
pre-1988	2007	2007	2008	2009	2010
1988-1995	2008	2008	2009	2010	2011
1996-2002	2009	2009	2010	2011	2012
2003-2006	2010	2010	2011	2012	2013

\* Compliance date refers to December 31<sup>st</sup> of the year indicated.

\*\* If the percentage of non-yard truck equipment in a fleet is not a whole number, conventional rounding practices apply (i.e., if less than 0.5, round down; if 0.5 or greater, round up).

## Identification & Demonstration of Emission Control Systems for RTG Cranes, Side Picks, and Top Picks

**Goal:** Identify and demonstrate high efficiency retrofit emission controls and collect data that will lead to verification

**Task 1:** Datalogging

**Task 2:** Solicitation of technology providers

**Task 3:** Solicitation of terminal operators/equipment

**Task 4:** Demonstration study and emissions testing

**Timeline:** June 2005 – March 2006

## Compliance Extensions

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- ♦ Engine near retirement
  - if retiring within one year of compliance date
- ♦ No VDECS available
  - annual extension (limited to two one-year extensions)
- ♦ Use of experimental Diesel PM Controls
  - up to 2 year extension
- ♦ Equipment manufacturer delays
  - Equipment must be purchased at least 6 months prior to compliance date
- ♦ Considering extension for minimum use requirement agreements

## Special Circumstances

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- ♦ **VDECS failure during warranty period**
- ♦ **VDECS failure outside of warranty period**



## Record Keeping Requirements

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- ◆ Records kept at the terminal
  - Information: owner or operator, equipment/engine, compliance extension, VDECS, fuel, statement of compliance
- ◆ Records kept in equipment
  - Label with compliance information: VDECS, certified onroad/off-road engine, planned compliance date, compliance extension

## Reporting Requirements

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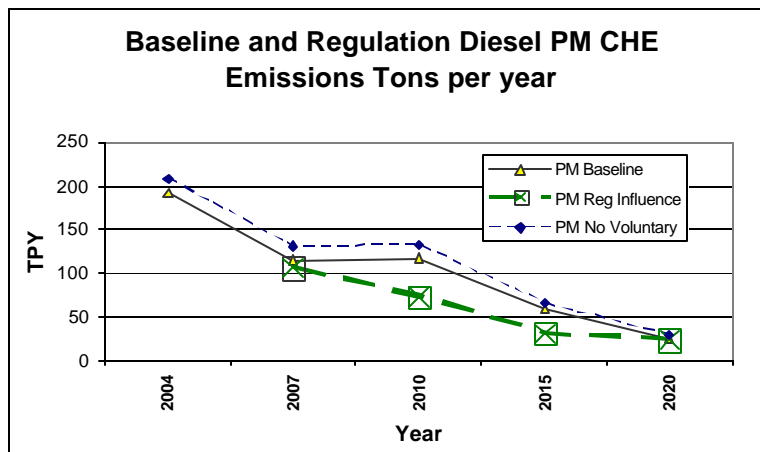
- ◆ Compliance Plan
  - submit by January 31, 2007
  - not binding; want to ensure owner/operator is aware of compliance requirements and has developed plan
- ◆ Demonstration of Compliance
  - submit by earliest applicable compliance date
  - identify control strategy implemented
- ◆ Annual Reporting
  - submit annually by January 31st beginning in 2007
  - include company and contact information and location of equipment

## Right of Entry, Prohibitions, and Severability

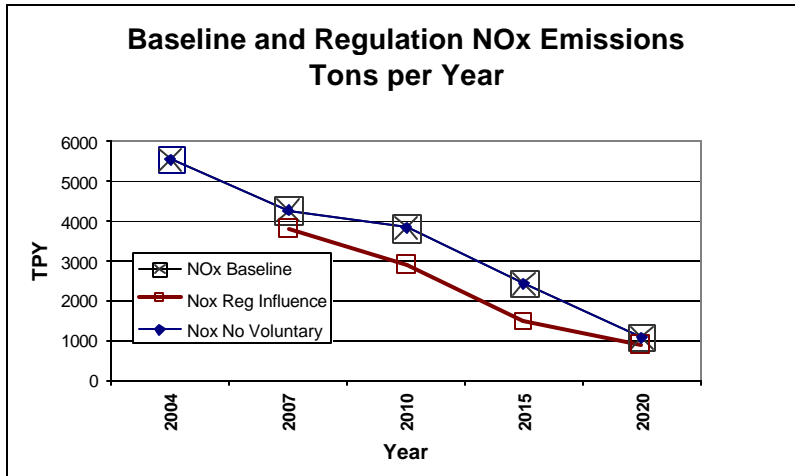
- ♦ Allows ARB agent or employee to enter premises and inspect
- ♦ Prohibits anyone from knowingly selling, renting, or leasing non-compliant equipment
- ♦ Separates from the rest of the regulation any portions that may be deemed invalid



## Preliminary Estimated Emission Reductions (Diesel PM)



## Preliminary Estimated Emission Reductions (NOx)



## Preliminary Cost Assumptions

Equipment Type	New Equipment Cost	Used Equipment Cost	Control Device	Control Device Average Cost
Crane	\$ 1,200,000		Passive DPF	\$ 17,520
Excavator	\$ 350,000	\$ 50,000	DOC	\$ 2,269
Forklift			Active DPF	\$ 6,000
Basic Container Handling Equip	\$ 400,000	\$ 50,000	DOC	\$ 2,269
Other	\$ 400,000	\$ 50,000	DOC	\$ 2,269
Sweeper/Scrubber	\$ 50,000	\$ 5,000	DOC	\$ 2,269
Tractor/Loader/Backhoe	\$ 75,000	\$ 10,000	DOC	\$ 2,269
Yard Tractor	\$ 60,000	\$ 6,000	On-road Engine Option	\$ 1,500

**Notes:**

Assumed linear depreciation to determine the remaining value of the equipment that was retired early.

Reporting Costs: \$10,000 for the first year and \$500 per year thereafter.



## Preliminary Cost Estimates

Total Annual Statewide Costs for Ports and Rail Including the Reporting Costs in 2004 Dollars			
Year	2007	2010	2015
Total Annual Cost (2004 \$)	\$ 3.8 million	\$ 4.3 million	\$ 2.8 million
PM Cost Effectiveness	\$35 – \$50 per pound PM reduced		

## Next Steps



- ♦ Revise draft proposal
- ♦ Additional workgroup meetings/workshops as necessary
- ♦ Staff report release on September 30<sup>th</sup>
- ♦ Board hearing in November 2005

## Contacts

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